

Agricultural Engineering

Course Description: Agricultural Engineering includes standards on metal fabrication and agriculture structures. Subject matter will include hot/cold metal work, cost and material computation, electrical wiring, engine service and repair, blueprint reading, drawing and selection of appropriate materials for projects.

Recommend Prerequisite: Agriscience (HQ), Principles of Agricultural Sciences or Principles of Horticultural Sciences

Recommended Credit(s): 1 or 2

Recommended Grade Level: 11th or 12th

Course Codes:** A10 – **5128** or A12 - **5178**

** Use A12 Course Code number for all programs. A10 should be used for 10 month programs only.

Agricultural Engineering

Standard 1.0

Evaluate career options in the area of agricultural engineering.

Standard 2.0

Systematically determine the correct operational procedures for advanced metal fabrication and welding.

Standard 3.0

Evaluate the principles of electricity, including electrical wiring, equipment and motors.

Standard 4.0

Utilize the principles and techniques involved in the construction of agricultural structures.

Standard 5.0

Integrate core academic competencies in the area of agricultural engineering.

Standard 6.0

Demonstrate premier leadership and personal growth needed for career success and advancement in the area of agricultural engineering.

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Standard 1.0

Evaluate career options in the area of agricultural engineering.

Learning Expectations and Performance Indicators:

- | | | |
|-----|---|---|
| 1.1 | Research and prepare a written report on career goals related to agricultural engineering. | 1 |
| 1.2 | Prepare a career plan for a related area in agricultural engineering. | 1 |
| 1.3 | Research utilizing current resources to develop a written report on career opportunities in agricultural manufacturing. | 1 |

Standard 2.0

Systematically determine the correct operational procedures for advanced metal fabrication and welding.

Learning Expectations and Performance Indicators:

- | | | |
|-----|--|---|
| 2.1 | Demonstrate and explain the proper use of gas cutting and welding equipment. | 1 |
| 2.2 | Demonstrate and explain the proper use of Arc welding equipment. | 1 |
| 2.3 | Demonstrate and explain the proper use of MIG welding equipment. | 1 |
| 2.4 | Demonstrate and explain the principles and techniques involved in blueprint reading and drawing. | 1 |
| 2.5 | Develop a written bill of materials and project costs. | 1 |
| 2.6 | Utilize principles of advanced metal fabrication. | 1 |
| 2.7 | Utilize metal working tools and machines to complete projects. | 1 |
| 2.8 | Demonstrate approved safety practices in a shop/lab environment. | 1 |
| 2.9 | Complete a safety test with 100 percent accuracy. | 1 |

Standard 3.0

Evaluate the principles of electricity, including electrical wiring, equipment and motors.

Learning Expectations and Performance Indicators:

- | | | |
|-----|--|---|
| 3.1 | Explain the proper wiring of a circuit breaker panel. | 2 |
| 3.2 | Read and interpret a house-wiring diagram. | 2 |
| 3.3 | Develop a bill of materials and project costs for an electrical project. | 2 |
| 3.4 | Use electrical tools properly. | 2 |
| 3.5 | Read and interpret blueprints, drawings, electrical codes and electrical diagrams. | 2 |

Standard 4.0**Utilize the principles and techniques involved in the construction of agricultural structures.**

Learning Expectations and Performance Indicators:

- | | | |
|-----|---|---|
| 4.1 | Compare the advantages and disadvantages of different types of siding. | 2 |
| 4.2 | Compare the advantages and disadvantages of different types of roofing. | 2 |
| 4.3 | Determine the importance of stress loads of different materials. | 2 |
| 4.4 | Evaluate the use of different types of foundations. | 2 |
| 4.5 | Examine methods of finishing concrete and laying cinder blocks. | 2 |
| 4.6 | Write project plan and costs of constructing agriculture buildings. | 2 |

Standard 5.0**Integrate core academic competencies in the area of agricultural engineering.**

Learning Expectations and Performance Indicators:

- | | | |
|-----|--|---|
| 5.1 | Calculate construction problems using algebraic formulas | 1 |
| 5.2 | Solve arithmetical problems related to construction. | 1 |
| 5.3 | Solve speed, time, and distance problems. | 1 |
| 5.4 | Solve problems relating to volume, area and linear measurement. | 1 |
| 5.5 | Explain the conversion of chemical energy to mechanical energy. | 1 |
| 5.6 | Describe the difference in strengths of various species of lumber. | 1 |

Standard 6.0**Demonstrate premier leadership and personal growth needed for career success and advancement in the area of agricultural engineering.**

Learning Expectations and Performance Indicators:

- | | | |
|-----|--|---|
| 6.1 | Demonstrate positive work attitudes and behaviors based on the FFA code of ethics. | 1 |
| 6.2 | Describe career plans that reflect permanent learning. | 1 |
| 6.3 | Demonstrate correct time management skills. | 1 |
| 6.4 | Help others learn in order to achieve goals and expectations through a supervised agricultural experience program. | 1 |
| 6.5 | Prepare to participate in FFA Agriculture Mechanics Career Development Events. | 1 |